Name ______________________ Class ______________ Date ______________

Skills Worksheet

Math Skills

Work

After you study each sample problem and solution, work out the practice problems on a separate sheet of paper. Write your answers in the spaces provided.

PROBLEM

A car has run out of gas. Fortunately, there is a gas station nearby. You must exert a force of 715 N on the car in order to move it. By the time you reach the station, you have done 2.72×10^4 J of work. How far have you pushed the car?

SOLUTION

Step 1: List the given and unknown values.

Given: force, $F = 715$ N

work, $W = 2.72 \times 10^4$ J

Unknown: distance, $d = ?$ m

Step 2: Rearrange the work equation to solve for distance.

work = force × distance $W = Fd$

$$\frac{W}{F} = \frac{Fd}{F} = d$$

Step 3: Insert the known values into the equation, and solve.

$$d = \frac{2.72 \times 10^4 \text{ J}}{715 \text{ N}} = \frac{2.72 \times 10^4 \text{ N}\cdot\text{m}}{715 \text{ N}}$$

$d = 38.0$ m

PRACTICE

1. You must exert a force of 4.5 N on a book to slide it across a table. If you do 2.7 J of work in the process, how far have you moved the book?

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2. A catcher picks up a baseball from the ground. If the unbalanced force on the ball is 7.25×10^{-2} N and 4.35×10^{-2} J of work is done to lift the ball, how far does the catcher lift the ball?

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3. The smallest bird is the Cuban bee hummingbird, which has a mass of only 1.7 g. If this bird did 6.8×10^{-4} J of work by exerting an upward force of 5.6×10^{-3} N, how far did it fly?